APPENDIX C

ECONOMIC IMPACT ASSESSMENT BY KENNECOTT

A study prepared by Policy Planning and Evaluation, Inc. (PPE), of McLean, Virginia, for the U.S. Environmental Protection Agency to assess the economic consequences of the proposed reinterpretation of solid waste exemption for the primary smelting and refining industry was reviewed in detail by Kennecott. The PPE study concludes that the cost to the primary smelting and refining industry resulting from the elimination of the exclusion would not create economic hardship. Based on its review, Kennecott believes this conclusion cannot be supported because:

1. The study uses inappropriate data to project future financial results for the industry,

2. Economic criteria used to measure impacts are not justified, and

3. The method used to measure costs is inappropriate for cash-short and capital-intensive industries.

Industry Baseline Conditions

The methodology adopted for a study of the primary smelting and refining industry requires selection of a baseline period that should characterize typical performance of

the industry. The net present value test employed in the PPE study uses average operating income over the baseline period to represent the long-term "constant" income required by the analysis. Thus, the study results are critically sensitive to the selection of an appropriate baseline period--one that truly characterizes the performance of the industry over the business cycle and in the long term.

The PPE study considers industry performance over the six years from 1978 through 1983, but only the three years from 1979 through 1981 are included in the baseline period. The study states that the selected three-year period constitutes a "balanced baseline" and that it contains "only the intermediate stages of a complete business cycle."

Although it might be argued that the 1979-1981 period is a "balanced baseline" for the U.S. economy as a whole, this period certainly does not represent the "intermediate stages of a complete business cycle" for sectors of the economy relevant to the primary smelting and refining industry. In the course of a business cycle, different economic sectors may be out of phase; one sector may lead or lag another. This is illustrated by the behavior of four economic indicators compared in the following table.

MEASURES OF THE U.S. ECONOMY 1978-1983

	GNP (billions of 1972 $)	Industrial Production Index (1967 = 100)		Real Copper Price (1984 c/lb)
		Total	Primary Metals	
1978	1,439	146	120	90.8
1979	1,479	153	121	111.9
1980	1,475	147	102	111.4
1981	1,512	151	108	88.3
1982	1,480	139	75	76.0
1983	1,535	148	85	78.4
Averages				
Baseline 1979-1981	1,489	150	110	103.9
Six years 1978-1983	1,487	147	102	92.8
Ratio of Baseline to 6-year avg.	1.00	1.02	1.08	1.12

Sources: Statistical Abstract of the U.S., 1985, American Bureau of Metal Statistics, and EPA Contractor's Estimate of U.S. producer copper prices in 1984 dollars.

The first indicator, GNP, represents a broad measure of economic activity. The GNP average for the baseline period is nearly the same as the six-year average (ratio of baseline to six-year average = 1.00). Consequently, the baseline period may in some sense be a "balanced baseline" for the economy as a whole. The remaining three indicators, however, expose the disparity in response between the overall economy,

on the one hand, and the industrial sector, the primary metals sector, and the copper industry, on the other. These three focused measures of sectoral strength averaged from 2 to 12 percent higher for the baseline period than for the total six-year period. Thus, the baseline period chosen by PPE is not a "balanced" sample of the economic cycle for the industrial or metals sectors.

Detailed examination of the above table further confirms the conclusion that, for the industrial and metals sectors, the selected baseline period represents a peak, rather than an intermediate stage, of the business cycle. For all three of the industrial and metal industry indicators, the highest year measured falls in the baseline period. In two of the three sectors, the two highest measurements are contained in the three-year baseline. Moreover, the two indicators specific to the metals industry (primary metals and copper price) both suggest a pattern of decline--apart from any cyclical pattern--over the six-year period. Thus, the evidence does not support the use of the 1979 through 1981 period as a baseline to characterize the long-term performance of the primary smelting and refining industry. In fact, the selected baseline represents, not a typical period, but a period of relative prosperity for this industry in general and the copper industry in particular.

More specific to Kennecott, an analysis of the company's published results for the mining sector from 1978 to the present illustrates the misleading results that can be derived by choosing the years used in the PPE study.

	Kennecott Operating Profit (Loss) ($ Millions)
1978	($ .1)
1979	$163.9
1980	$131.4
1981	$ 24.1
1982	($144.0)
1983	($ 92.7)
1984	($159.7)
1985 (January through September)	($120.8)

Choosing the years 1979 through 1981, which were the only profitable ones over the last eight, and using these profits to project future exonomic activity, greatly distorts PPE's study.

Economic Impacts

The economic impact of the proposed reinterpretation on Kennecott and the U.S. copper industry is severe. The PPE study is misleading in this aspect as it indicates almost no impact from the proposed reinterpretation. Both the required investment capital and the required annual operating and main-

tenance costs for compliance with the reinterpretation are grossly underestimated. Kennecott retained an outside consulting firm, Dames and Moore, to estimate capital investment and operating costs for its three integrated facilities in Utah, New Mexico, and Arizona. The Dames and Moore study indicates minimum costs of $27.8 million in initial capital investment and at least $11.6 million in annual operating and maintenance costs (see Appendix C). Extrapolation of these estimates to include the whole U.S. primary copper industry suggests capital investment requirements of around $111 million and annual operating and maintenance costs of around $46 million; these estimates are more than forty times larger than the estimates by PPE.

The Dames and Moore estimates for Kennecott's three plants have been adjusted by Kennecott to include capital for 20 years of operations and to deduct annual costs that the company is incurring, as follows:

	$ Millions
Initial Capital for 10 Years Production (per Dames and Moore)	$ 27.8
Increased for Additional 10 Years Production (per Kennecott)	10.8
Total Capital	$ 38.6
Annual Operating and Maintenance Cost (per Dames and Moore)	$ 11.6
Decreased to Reflect Costs Currently Incurred (per Kennecott)	2.2
Total Additional Operating and Maintenance Costs/Year (pre-tax)	$ 9.4
Post-Closure Costs for 30 Years Operating and Maintenance Cost/Year (per Dames and Moore)	$ .08
Adjusted for Required Second Pond at Utah (per Kennecott)	.03
Total Annual Post-Closure Costs	$ .11

With these adjustments, the EPA and Kennecott estimates are compared below:

	($ Millions, Pre-Tax) EPA Contractor	Kennecott Contractor After Adjustments
Capital Investment Required		
For All U.S. Plants (11) Affected	$2.675	
For Kennecott's 3 Plants		$38.6
Annual Operating and Maintenance Costs		
For All U.S. Plants (11) Affected	$ .236	
For Kennecott's 3 Plants		$ 9.4

The PPE study uses its estimate of capital and operating costs to do screening analyses to identify plants that are candidates for closure. Due to the unrealistic costs assumed, none of the copper plants appears threatened. However, the $9.4 million in additional annual operating costs for the three Kennecott plants and the depreciation charges for the $38.6 million capital investment, amortized over 20 years, result in an annual cost increase for Kennecott's facilities of $11.3 million or about 1.4¢ per pound of copper produced. This represents an increase of about 6% to 8% in smelting and refining costs due to the reinterpretation. Such a cost increase is significant to a company struggling to compete against foreign copper producers that are not subject to environmental regulation.

The cost methodology used by Kennecott in the previous paragraph is a standard one by which businesses report their financial results and measure operating cost increases. The PPE study, by contrast, uses an unconventional method for determining the increase in operating costs. Using PPE's methodology and the costs developed by Kennecott's contractor, the total annual compliance cost to Kennecott would be $6.3 million per year after taxes rather than $11.3 million pretax. The difference is due to taxes and the inclusion of closure

costs and costs for care-and-maintenance after closure. The closure-related costs should increase the annual compliance costs slightly. The tax benefits decrease annual compliance costs. However, the tax benefits probably have been overstated due to PPE's assumptions on depreciation and investment tax credits. Tax benefits from these two items would be reduced by the House-passed tax bill likely to be enacted in 1986. If the House bill becomes law, Kennecott's estimate of annual compliance costs for its three properties increases by $1.5 million, from $6.3 million to $7.8 million per year using EPA's methodology.

In addition, several of the economic criteria used by PPE for measuring impacts and costs to industry are misleading and inappropriate. For example, the real cost of capital for the copper industry is determined by PPE to be 1.4% (Table B-1) by using a formula based upon economic theory only. In the real world, this estimate for cost of capital is far too low. Additionally, the ratio of operating income to sales is reported in Table B-1 as 1.88% for the copper processing industry. Yet the screening analysis, for determining whether or not a copper plant would be seriously affected by the EPA reinterpretation, uses an operating cost

increase of 1% of sales revenue as the initial "point of pain." This trigger point (1%) is slightly more than half the total indicated operating margin (1.88%) for copper processing. A copper processing plant (smelter or refinery) would be seriously affected by this 53% change in operating income and the effect would be serious even at lower levels of cost increase. The criteria used for estimating economic impact are better suited to theoretical situations than to the real world of industry.

The net present value test and the liquidity test in the study's plant closure analysis are both used in a manner quite different from the norm used by industry. This casts doubt upon their validity in the real world.

The net present value test, as used by PPE to approximate long-term solvency, is bound to produce unrealistic results because it incorporates a real cost of capital of 1.4% rather than a real-world cost close to 7%. The EPA assumption is off by a factor of five times.

The liquidity test, as used by PPE to estimate short-term survival, states that a plant will close if the costs to comply with the environmental ruling cause negative cash flows in the foreseeable future. Cash flows are defined as earnings after all operating expenses (including depreciation at

replacement value) and taxes. In partial recognition of the need to raise capital, the EPA assumes the required environmental investment will be amortized over a period of five years for this test. A complex formula is used to derive a modified total annual compliance cost.

There is no need to use a complex formula to calculate the liquidity test. The annual cash flows of almost all copper smelters and refineries in the U.S., averaged over the eight-year period from 1978 through 1985 and using replacement value as a basis for depreciation charges, are negative before any added costs for compliance with any new EPA ruling. These facilities are continuing to operate because historical value is used as the basis for depreciation and they are part of an integrated, larger copper production complex. PPE's liquidity test is contorted by the use of unrealistic capital and operating costs.

In summary, contrary to the statements in the PPE study, the increase in capital expenditures and operating costs for copper smelters and refineries from the EPA reinterpretation would have a significant and detrimental effect upon the plants and could contribute to closure decisions.